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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,927	12/29/2003	Luiz M. Franca-Neto	884.B65US1	6689
21186	7590	12/31/2007	EXAMINER	
SCHWEGMAN, LUNDBERG & WOESSNER, P.A.			WANG, TED M	
P.O. BOX 2938			ART UNIT	PAPER NUMBER
MINNEAPOLIS, MN 55402			2611	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/749,927	FRANCA-NETO, LUIZ M.
	<b>Examiner</b>	<b>Art Unit</b>
	Ted M. Wang	2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 29 December 2003.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-24 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-3 and 6-24 is/are rejected.
- 7) Claim(s) 4 and 5 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 29 December 2003 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date: _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Objections***

1. Claim 12 is objected to because of the following informalities:
  - Claim 12, line 2, change "and" to --- or ---.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1, 2, 7, 8, 10, 12, 15 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Karki et al. (US 6,454,533).
  - With regard claim 1, Karki et al. discloses an apparatus, comprising:

a modulator (Fig.2 element 208) having a clock input including a duty cycle (Fig.2 elements 202 and 204) to be modulated by an analog message signal (Fig.2 element 206 and Fig.6), the modulator to provide a modulated carrier with a monotonically-increasing fundamental frequency component (Fig.9) to a switching amplifier (Fig.2 element 210 and column 1 lines 15-16).

- With regard claim 2, Karki et al. further discloses wherein the duty cycle is limited to less than about 50% (column 1 lines 36-47).
- With regard claim 7, which is an apparatus claim related to claim 1, all limitation is contained in claim 1 (where Examiner considers that any signal can be considered as composite sine wave signals). The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 8, which is an apparatus claim related to claim 2, all limitation is contained in claim 2. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 10, which is a system claim related to claim 1, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 12, Karki et al. further discloses wherein the switching power amplifier is selected from a class D amplifier (Fig.2 element 210 and column 1 lines 15-16).

- With regard claim 15, which is a method claim related to claim 1, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 16, which is a method claim related to claim 2, all limitation is contained in claim 2. The explanation of all the limitation is already addressed in the above paragraph.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 3, 6, 7, 9-11, 13-15 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Darabi et al. (US 7,233,772).

- With regard claim 1, Darabi et al. discloses an apparatus, comprising:
  - a modulator (Fig.2 element 58) having a clock input including a duty cycle (Fig.2 element 53 output to element 58 input) to be modulated by an analog message signal (Fig.2 element 206 and Fig.6), the modulator to provide a modulated carrier with a monotonically-increasing fundamental frequency component (Fig.2 element 58 output to element 60 input, where it is inherent that the modulator (mixer) output will contain a modulated carrier with a

monotonically-increasing fundamental frequency component.) to a power amplifier (Fig.2 element 62).

Darabi et al. discloses all of the subject matter as described in the above paragraph except for specifically teaching the power amplifier is a switching amplifier.

However, Darabi et al. further teaches that the power amplifier could be a switching power amplifier (column 29 lines 1-16) in order to power down the power amplifier so that the power on chip could be saved. Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to replace the PA 62 with a switching power amplifier (Fig.25 and 26) as taught by Darabi et al. so as to power down the power amplifier so that the power on chip could be saved.

- With regard claim 3, Darabi et al. further discloses wherein the clock input includes a frequency of about 500 MHz to about 100 GHz (column 28 lines 43-54).
- With regard claim 6, Darabi et al. further discloses wherein the analog message signal includes a plurality of quadrature amplitude modulated symbols (column 6 lines 47-67).
- With regard claim 7, which is an apparatus claim related to claim 1, all limitation is contained in claim 1 (where Examiner considers that any signal can be considered as composite sine wave signals). The explanation of all the limitation is already addressed in the above paragraph.

- With regard claim 9, Darabi et al. further discloses wherein the analog message signal includes a plurality of quadrature amplitude modulated symbols (column 6 lines 47-67).
- With regard claim 10, which is a system claim related to claim 1, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 11, Darabi et al. further discloses an antenna to couple to the switching power amplifier (Fig.1 element 8 and column 10 lines 47-60).

Although Darabi et al. doesn't specifically disclose a monopole antenna, such limitation is merely a matter of design choice and would have been obvious in the system of Darabi et al. The limitation in claim 11 does not define a patentably distinct invention over that in Darabi et al. since both the invention as a whole. Therefore, to use a monopole antenna in Darabi's system would have been a matter of obvious design choice to one of ordinary skill in the art.

- With regard claim 13, Darabi et al. further discloses a driver to directly couple the modulator to the switching power amplifier (Fig.2 element 60).
- With regard claim 14, Darabi et al. further discloses a digital-to-analog converter to provide the analog message signal (Fig.2 element 56 column 10 lines 46-60,).
- With regard claim 15, which is a method claim related to claim 1, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.

- With regard claims 17 and 18, Darabi et al. further discloses wherein the amplitude of the analog message signal changes according to a multiple carrier communication technique (column 6 lines 47-67).
- With regard claims 19 and 20. Darabi et al. further discloses pre-distorting (Fig.2 element 56) a quadrature amplitude modulation (QAM) signal (column 6 lines 47-67) included in the analog message signal (Fig.2 element 56, where the output signal of the element 56, LPF, are analog signals) to compensate non-linearity associated with the switching amplifier (This is the inherent property of the Darabi's modulator and switching power amplifier circuitries).

6. Claims 2, 8, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Darabi et al. (US 7,233,772) in view of O'Connor et al. (US 6,693,271).

- With regard claim 2, Darabi et al. discloses all of the subject matter as described in the above paragraph except for specifically teaching wherein the duty cycle is limited to less than about 50%

However, O'Connor et al. teaches wherein the duty cycle is limited to less than about 50% (column 6 lines 43-67).

It is desirable to have the duty cycle is limited to less than about 50%. The reason for this is that this signal is used to modulate the switching amplifier. By making the duty cycle substantially 50%, the active phases and the inactive phases of the switching amplifier will have the same duration. Consequently, the condition of zero average gain of the switching amplifier will be achieved when the amplifier gain during the active phase is equal in magnitude but opposite in

sign to the amplifier gain during the inactive phases of the modulation. If some errors associated with signal phase shifts can be tolerated, the signal 123 can also be used to modulate the light source directly. Otherwise, as illustrated, the 50% duty cycle square wave modulation can be used to trigger a pulse of shorter duration than the active phase of the signal used to modulate the switching amplifier. As mentioned above the use of this secondary pulse generator permits the active phase of the light output to be constrained entirely to the active phase of the switching amplifier in the presence of amplifier induced phase shifts and prevents self-interference (column 6 line 53 – column 7 line 4). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the duty cycle that is limited to less than about 50% as taught by O'Connor et al. into Darabi's RF clock circuitry (Fig.4 element 14) so as to prevents self-interference.

- With regard claim 8, which is an apparatus claim related to claim 2, all limitation is contained in claim 2. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 16, which is a method claim related to claim 2, all limitation is contained in claim 2. The explanation of all the limitation is already addressed in the above paragraph.

7. Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Darabi et al. (US 7,233,772) in view of Karki et al. (US 6,454,533).

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- With regard claim 12, Darabi et al. discloses all of the subject matter as described in the above paragraph except for specifically teaching wherein the switching power amplifier is selected from a class D amplifier.

However, Karki et al. teaches wherein the switching power amplifier is selected from a class D amplifier (Fig.2 element 210 and column 1 lines 15-16).

It is desired to have a class D amplifier as the switching amplifier. The reason for this is that Class D amplifiers, also known as a switching amplifiers, are amplifiers that switch at a high frequency. It uses active power circuit elements, such as switches that are alternately driven to saturation and cut-off at a high switching speed (column 1 lines 14-19) in order to avoid the nonlinear amplification operation.

8. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Karki et al. (US 6,454,533)" in view of Langberg et al. (US 5,852,630).

- With regard claim 21, Karki et al. discloses all of the subject matter as described above except for the method written by a software program embodied in a computer-readable medium.

However, Langberg et al. teaches that the method and apparatus for a transceiver warm start activation procedure with precoding can be implemented in software stored in a computer-readable medium. The computer-readable medium is an electronic, magnetic, optical, or other physical device or means that can contain or store a computer program for use by or in connection with a computer-related system or method (column 3, lines 51-65). One skilled in the

art would have clearly recognized that the method of “Karki et al.” would have been implemented in a software. The implemented software would perform same function of the hardware for less expense, adaptability, and flexibility. Therefore, it would have been obvious to have used the software in “Karki et al.” as taught by Langberg et al. in order to reduce cost and improve the adaptability and flexibility of the communication system.

- With regard claim 22, which is a computer readable medium claim related to claims 21 and 2, all limitation is contained in claims 21 and 2. The explanation of all the limitation is already addressed in the above paragraph.
9. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Darabi et al. (US 7,233,772) in view of Langberg et al. (US 5,852,630).

- With regard claim 21, Darabi et al. discloses all of the subject matter as described above except for the method written by a software program embodied in a computer-readable medium.

However, Langberg et al. teaches that the method and apparatus for a transceiver warm start activation procedure with precoding can be implemented in software stored in a computer-readable medium. The computer-readable medium is an electronic, magnetic, optical, or other physical device or means that can be contain or store a computer program for use by or in connection with a computer-related system or method (column 3, lines 51-65). One skilled in the art would have clearly recognized that the method of “Darabi et al.” would have been implemented in a software. The implemented software would perform same

function of the hardware for less expense, adaptability, and flexibility. Therefore, it would have been obvious to have used the software in "Darabi et al." as taught by Langberg et al. in order to reduce cost and improve the adaptability and flexibility of the communication system.

- With regard claim 22, which is a computer readable medium claim related to claims 21 and 2, all limitation is contained in claims 21 and 2. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claims 23 and 24. Darabi et al. further discloses pre-distorting (Fig.2 element 56) a quadrature amplitude modulation (QAM) signal (column 6 lines 47-67) included in the analog message signal (Fig.2 element 56, where the output signal of the element 56, LPF, are analog signals) to compensate non-linearity associated with the switching amplifier (This is the inherent property of the Darabi's modulator and switching power amplifier circuitries).

#### ***Allowable Subject Matter***

10. Claims 4 and 5 are objected to as being dependent upon an objected claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M. Wang whose telephone number is 571-272-3053. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

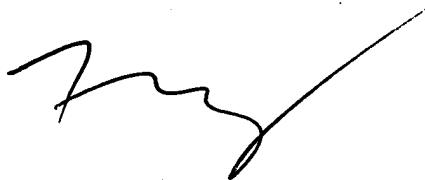
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ted M Wang  
Examiner  
Art Unit 2611

Ted M. Wang

A handwritten signature in black ink, appearing to read "Ted M. Wang". It is written in a cursive style with a long, sweeping line extending from the end of the first name towards the end of the last name.